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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* YUN SOO CHOE and OK KEUN SONG

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Appeal 2008-006322  
Application 10/652,493  
Technology Center 3700

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Decided: July 30, 2009

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Before WILLIAM F. PATE III, LINDA E. HORNER, and  
KEN B. BARRETT, *Administrative Patent Judges*.

WILLIAM F. PATE III, *Administrative Patent Judge*.

DECISION ON APPEAL

#### STATEMENT OF CASE

This is an appeal from the final Office Action of October 12, 2006.

Claims 1-4, 7-27, and 29-31 stand rejected and have been appealed. Claim 28, as amended after final rejection, has been allowed, and claims 5 and 6 have been canceled. We have jurisdiction over the appeal pursuant to 35 U.S.C. §§ 134 and 6.

The claimed subject matter is directed to a heating crucible having a separate cover. The cover has a heating element, a reflective layer above the heating element and a heat resistant layer above the reflective layer.

Claim 1, reproduced below, is further illustrative of the claimed subject matter.

1. A heating crucible for an organic thin film forming apparatus, the heating crucible comprising:

a main body in which to contain an organic substance;

a cover provided on the main body, the cover formed of an insulating material and having a nozzle through which a gaseous organic substance comes out from the main body;

a cover heater formed as a thin film type on the top surface of the cover;

a heat-resistant layer formed on a surface of the cover heater;

a reflective layer between the cover heater and the heat-resistant layer; and

a body heater heating the main body.

#### REFERENCES

The references of record relied upon by the examiner as evidence of obviousness are:

Chandler	US 2,799,764	Jul. 16, 1957
Isaacson	US 3,842,241	Oct. 15, 1974
Takagi	US 4,217,855	Aug. 10, 1980
Okuda	US 4,804,823	Feb. 14, 1989
Chow	US 5,157,240	Oct. 20, 1992
Murakami	US 5,728,223	May 17, 1998
Chen	US 6,024,799	Feb. 15, 2000
Bichrt	US 6,162,300	Dec. 19, 2000
Kano	US 6,242,719 B1	Jun. 05, 2001

#### REJECTIONS

Claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31 stand rejected under 35 U.S.C. § 103 as unpatentable over Chow in view of Chandler or Isaacson.

Claims 3, 14, and 19 stand rejected under 35 U.S.C. § 103 as unpatentable over Chow in view of Chandler or Isaacson and further in view of Kano.

Claims 8, 15, and 26 stand rejected under 35 U.S.C. § 103 as unpatentable over Chow in view of Chandler or Isaacson and further in view of Bichrt.

Claim 10 stands rejected under 35 U.S.C. § 103 as unpatentable over Chow in view of Chandler or Isaacson and further in view of Okuda.

Claim 20 stands rejected under 35 U.S.C. § 103 as unpatentable over Chow in view of Chandler or Isaacson and further in view of Takagi

Claim 27 stands rejected under 35 U.S.C. § 103 as unpatentable over Chow in view of Chandler or Isaacson and further in view of Chen or Murakami.

## ISSUE

The issue that underlies all of the rejections on appeal is whether the Examiner has erred in rejecting claim 1 as unpatentable over Chow in view of Chandler or Isaacson. With respect to this issue, Appellants argue that Chow does not disclose a heat resistant layer as claimed in Appellants' independent claim and that it would not have been obvious from the combined teachings of Chow and Chandler or Chow and Isaacson to include a reflective layer in the heated cover of Chow.

## FINDINGS OF FACT

1. Appellants have defined "heat resistant layer" in Appellants' Specification. "The heat resistant layer 46 blocks heat generated by the cover heater 43 from being transferred to an external space above the heating crucible 50, i.e., the internal space of the vacuum chamber 31, so that all of the heat generated by the cover heater 43 is transmitted inside the heating crucible 50." See para. [0035], second sentence.
2. Chow discloses a crucible which includes a main body 10 and cover 11. See col. 2, ll. 59-61. The cover is described in more detail starting in col. 5, l. 34. The cover has a first substrate layer 20' on which a thin film heating element 22' is placed. On top of the inner heating element 22' an insulating layer 23' and an outer heating element 24' are provided. Finally, a protective cover layer 25' overlies the outer heating element. The purpose of the protective layer 25' is to avoid contaminants

being incorporated into the thin film being deposited. These contaminants arise from the heating of the inner and outer heating elements 22' and 24'. See col. 6, ll. 29-35. The crucible and cover of Chow are formed of pyrolytic boron nitride. See col. 2, l.7; co. 2, l. 47; col. 3, ll. 62-63; col. 5, ll. 34-48. Chow differs from the claimed subject matter in that Chow does not disclose a reflective layer between the cover heater and the protective layer 25'.

3. Chandler discloses a panel heating device for space heating applications in which the goal of the invention is to project infrared radiation that is inherently diffuse in nature, as shown in Fig. 2, rather than having beams of parallel heat rays as illustrated in Fig. 1. The Examiner directs our attention to the embodiment shown in Fig. 5 which shows a convoluted reflective layer 62 formed on the back of insulating layer 68. Insulating layer 68 itself backs up the resistance layer 72 which is the electrically powered heating element of the panel. Layer 78 of paper, paperboard, cloth, or other suitable material is the backing layer for the reflective layer in the embodiment shown in Fig. 5. See col. 7, ll. 3-45. Chandler differs from the claimed subject matter in that Chandler is not directed to a heating crucible, nor does Chandler disclose that the backing layer 78 should be a heat resistant layer.
4. Isaacson discloses a heater for an aquarium tank. The heater is comprised of a heating element, which is a nichrome wire 51, embedded in a silicone rubber sheet 53. See col. 2, ll. 56-65. A

thermal insulating board 52 is provided underneath the silicone rubber sheet and a reflective layer 56 is glued to the thermal insulating board 52. See col. 3, ll. 5-9. A plastic frame or holder 40 encapsulates these layers and provides a surrounding flange 46 to secure the heater to the aquarium wall. See col. 2, ll. 46-50. Isaacson differs from the claimed subject matter in that Isaacson does not disclose a reflective layer in the context of a heating crucible, and Isaacson's frame or holder 40 is not comprised of a heat resistant layer.

5. The patents to Kano, Bichrt, Okuda, Takagi, Chen and Murakami have been cited by the Examiner to show features claimed in dependent claims.

#### PRINCIPLES OF LAW

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 550 U.S. at 406-407 (“While the sequence of these questions

might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”).

The Supreme Court stated that in cases involving more than the simple substitution of one known element for another, or the mere application of a known technique to a piece of prior art ready for the improvement, it will be necessary to “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *Id.* at 417-418. The Court noted that “[t]o facilitate review, this analysis should be made explicit.” *Id.* at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”)

“35 U.S.C. § 112, ¶ 2 requires that the specification of a patent ‘conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.’ Because claims delineate the patentee’s right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds of the protected invention, i.e., what subject matter is covered by the exclusive rights of the patent. Otherwise, competitors cannot avoid infringement, defeating the public notice function of patent claims.” *Halliburton Energy Services, Inc. v M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008) (citations omitted).

The definiteness of claim language must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and of the

particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. *In re Moore*, 439 F.2d 1232 (CCPA 1971). *See also, In re Cohn*, 438 F.2d 989, 993 (CCPA 1971) (sustaining rejection of claims under 35 U.S.C. § 112, second paragraph, as being indefinite, where the claims were inherently inconsistent with the description, definitions, and examples appearing in applicant's specification).

When a term of degree is used in a claim, it is incumbent upon the applicant to indicate in the specification some standard for measuring or interpreting that degree. *See Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984).

## ANALYSIS

We will not sustain the obviousness rejections on appeal. Appellants have defined "heat resistant layer" in the Specification and indicate that the heat resistant layer prevents radiated heating in the external space above the heating crucible. Fact 1. Thus, the Examiner's broad construction of "heat resistant layer" found on page 8 of the Answer is an unreasonable claim construction. The Examiner has argued that "heat resistant" is a broad term and can be broadly interpreted as any layer that impedes a heat transfer. However, there is no certainty that the protective layer 25' of Chow impedes a heat transfer, since it is made from pyrolytic boron nitride like the rest of the crucible and cover. Since this substance transmits heat from the heaters in the lid into the internal space of the crucibles without touching the molten material, it is reasonable to assume that the pyrolytic boron nitride is not a heat resistant layer as Appellant defines the term. Therefore, not only is the

Examiner's claim construction of "heat resistant layer" unreasonably broad, but using the Examiner's broad claim construction, there is no evidence that Chow would meet the broad construction.

Moreover, with respect to the reflective layer, while Chandler and Isaacson do include reflective layers, there appears to be no rational basis for placing these layers in a crucible, particularly when these reflective layers are to be backed up by a heat resistant layer. The backing layer 78 of Chandler or the holder 40 of Isaacson are not seen as satisfying Appellants' claimed heat resistant layer as we have construed the term. Facts 3, 4.

Inasmuch as the rejection under § 103 of Chow in view of Chandler or Chow in view of Isaacson cannot be sustained, and it forms the basis for all of the obviousness rejections on appeal, we are constrained to reverse all of these rejections.

*New Grounds of Rejection under 37 C.F.R. § 41.50(b)*

Claims 1-4, 7-27, and 29-31 and allowed independent claim 28 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1 and 28 call for a cover heater formed as a thin film on the top surface of the cover. Next, the claim calls for a heat resistant layer formed on the surface of the cover heater. Such a recitation necessarily implies that the heat resistant layer is in surface-to-surface contact with the cover heater. However, in the next claim recitation, a reflective layer is claimed between the cover heater and the heat resistant layer. A reflective layer interposed between the cover heater and the heat resistant layer contradicts the surface-to-surface contact implied by the two prior claim recitations. Accordingly, claims 1-4, 7-27, and 29-31 and allowed independent claim 28 are rejected as

inherently inconsistent with themselves and with the descriptions, definitions, and examples appearing in Appellants' Specification.

Claims 2, 3, and 18-20 are rejected under 35 U.S.C. § 112, second paragraph, in that the heater claimed in claim 2 is said to be formed over the entire top surface of the cover. As plainly can be seen, the single wire pattern does not cover the entire top surface of Appellants' claimed cover. Likewise, in claim 18, the single wire is said to cover the entire body of the crucible. Thus claims 2, 3 and 18-20 are inherently inconsistent with the descriptions, definitions, and examples appearing in Appellants' Specification.

Claims 7, 8, 25, and 26 are rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Each of these claims recite that a material which is a constituent of Appellants' invention "has a good heat radiation property." However, Appellants have not provided in the Specification, any guidance as to what would satisfy a claim limitation directed to "a good heat radiation property" as opposed to a poor heat radiation property. When Appellants include terms of degree in a claim, it is incumbent upon Appellants to specify some standard for measuring or interpreting that degree. In this instance, Appellants have failed to do so.

## CONCLUSION

Appellants have established that the Examiner erred in rejecting claims 1-4, 7-27, and 29-31 on the ground of obviousness. The rejections of these claims are reversed. New rejections of 1-4, 7-27, and 29-31 and allowed independent claim 28 have been entered by the Board under § 112, second paragraph.

Under 37 C.F.R. § 41.50(b) a new ground of rejection has been entered. 37 C.F.R. § 41.50(b) provides that, “[A] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

Regarding the new ground of rejection, Appellant must, *WITHIN TWO MONTHS FROM THE DATE OF THE DECISION*, exercise one of the following options with respect to the new ground of rejection, in order to avoid termination of the appeal as to the rejected claims:

- (1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . ; or
- (2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

REVERSED: 37 C.F.R. § 41.50(b)

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